Watertight Concrete Basements with Sika® Concrete, Jointing, and Injection Technology
A watertight concrete structure can be designed to keep water in—or to keep water out—or both, particularly in the water industry. This can be the case for both fresh water supply and waste water treatment facilities.

In the future, even greater controls on water quality and increasing regulations for the protection of groundwater will require the construction of many more watertight concrete structures.

These same positive trends in environmental legislation, worldwide, will also lead to many more requirements for watertight construction.
Watertight Concrete Basements
The Key Technologies for Success

Concrete Technology
Dense impermeable concrete: watertight concrete must have minimized capillary volume and permeability.

Jointing Technology
Construction and movement joints

Jointing Technology
Construction and movement joints

Unforeseen Problems
1) Cracks
2) Honeycombing

Jointing Technology
Construction joints

Jointing Technology
Penetrations
Standards and Design Criteria for Watertight Concrete Basements

**Standard of Use** Adapted from BS 8102

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**Grade 1**
**Basic Utility**
- **Performance**
  - Some seepage and damp patches tolerable (min. wall thickness: 150 mm)
- **Typical usage**
  - Basic storage
  - Underground parking garages
  - Plant rooms (excluding electrical equipment)

**Sika solution**
- Waterproof concrete concept:
  - Sika® ViscoCrete® SCC technology
- Joint sealing systems:
  - Sika® Waterstops
  - Sikadur®-Combiflex® System
  - SikaSwell® S-2
  - SikaSwell® profiles
  - Sika® Injectoflex System

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**Grade 2**
**Better Utility**
- **Performance**
  - No water penetration but moisture vapour tolerable (min. wall thickness: 200 mm)
- **Typical usage**
  - Retail storage areas
  - Plant rooms and workshops requiring dryer environment with electrical equipment in the area

**Sika solution**
- Waterproof concrete concept:
  - Sika® ViscoCrete® SCC technology
- Joint sealing systems:
  - Sika® Waterstops
  - Sikadur®-Combiflex® System
  - SikaSwell® S-2
  - SikaSwell® profiles
  - Sika® Injectoflex System

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**Grade 3**
**Habitable**
- **Performance**
  - Dry environment – ventilated (min. wall thickness 250 mm)
- **Typical usage**
  - Residential areas, offices, restaurants
  - Leisure centres, gymnasiums

**Sika solution**
- Waterproof concrete concept:
  - Sika® ViscoCrete® SCC technology plus capillary pore blocking with Sika®-1 technology
- Joint sealing systems:
  - Sika® Waterstops
  - Sikadur®-Combiflex® System
  - SikaSwell® profiles
  - Sika® Injectoflex System

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**Grade 4**
**Special Requirements**
- **Performance**
  - Totally dry environment – ventilated (min. wall thickness: 300 mm)
- **Typical usage**
  - Archives and special equipment or storage areas
  - Controlled environment
  - Vapour-tight facilities

**Sika solution**
- Waterproof concrete concept:
  - Sika® ViscoCrete® SCC technology
  - Joint sealing systems:
    - Sika® Waterstops
    - Sikadur®-Combiflex® System
  - Flexible waterproofing:
    - Sikaplan® Membrane Systems

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**Typical additional Basement Performance Requirements**
- Chemically resistant surfaces
- Freeze/thaw/de-icing salt resistant surfaces
- Waste water resistant surfaces
- Hygienic and easy to clean surfaces
- Approved for contact with drinking water
- Crack-bridging capabilities

**Sika solution**
- Protective coatings:
  - Sikagard® coating systems
- Floors:
  - Sikafloor® systems

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Image of a three-dimensional model of a basement with various functional areas.
Sika® Concrete Production for Watertight Basement Structures
The Concreting Works on Site

The Formwork
In the formwork, any joints must be sufficiently tight and sealed to prevent any leaking of liquid grout from the concrete. The formwork must impart a smooth finish to the resulting concrete surface. To fulfil this requirement, use mould release agents like Sika® Separol®.

Formwork striking and removal
Loosening, striking and removing of the formwork should be done without shock or vibration to the fresh concrete. The minimum recommended hardening times before striking must be observed according to the specific concrete mix design and the site environmental conditions.

The Steel Reinforcement
In watertight construction, the design and fixing of steel reinforcement is particularly important to absolutely minimize any potential problems such as:
- Crack formation due to insufficient steel reinforcement or insufficient concrete cover, which could cause increased plastic shrinkage and cracking during construction. This would then be followed by accelerated rates of corrosion damage in service.
- Obstruction of joint sealing systems with congested reinforcement or by changes from their designed position and/or correct installation of the joints.
- Congestion of reinforcement leading to inadequate concrete compaction and voids or honeycombing in the hardened structure.

The Concrete Placement
Transport
For transport of watertight concrete always use a continuously mixing concrete truck.

Placing
Watertight concrete can be placed by all normal means including pumping, pouring and by skip. Care must be taken to ensure that reinforcement is not moved out of position and that any integral waterstopping joints are not damaged.

Compaction
Compaction by mechanical vibrating equipment such as vibrating beams and especially pokers, is to be kept to the absolute minimum by using Sika® ViscoCrete® SCC technology.

Stages/Lifts
The concrete stages or lifts required depend on the specific type of structure. General recommendations are for sections of the wall to be max. approx. 6 m (20 ft) long.

The Concrete Curing
For watertight concrete thorough and correct curing is essential, e.g. immediate covering with damp hessian and plastic sheeting or the immediate use of a curing compound which acts as a continuous evaporation reducing system, e.g. Sika® Antisol®.

Example without protective curing
In conditions of:
- 20 °C air temperature
- 20 °C concrete temperature
- 50 % relative air humidity
- 20 km/h wind speed

The graphic illustrates the quantity of water which evaporates from the exposed surface if no curing takes place. With the example shown there is a loss of approx. 0.6 litres of water per square metre, per hour (l/m² h).

The Concrete Construction (Daywork) Joints Surface Preparation
Use Sika® Rugasol® surface retarder on the formwork for the concrete joint faces, to easily obtain a suitable rough surface for optimum adhesion of the next pour with fresh concrete.

The Concrete Curing
Example without protective curing
In conditions of:
- 20 °C air temperature
- 20 °C concrete temperature
- 50 % relative air humidity
- 20 km/h wind speed
Sika® Concrete Production for Watertight Basement Structures
The Concrete Mix Design and Technology

Testing the Reduction in Water Permeability

Water absorption of concrete under pressure
To modified DIN 1048 (EN 206)
Water absorption in g/m² 2 h
Measures the maximum water penetration in mm after 24 hours with a water pressure of 5 bar.

Water absorption by suction
Test to the Swiss Standard SIA 162/1, Test No. 5. Determination of the water conductivity qw measures the water absorption in g from one hour to two weeks. Test requires a minimum of 5 concrete cores.

On site physical measurement
The water absorption Karsten coefficient “w” is measured with this special equipment to provide results (kg/m² 2 ½ h) of the water absorption in ml after 2 hours.

Reducing Capillary Pores and Voids by Water Reduction (Grades 1, 2, 3 and 4)

Preventing or greatly reducing Compaction Pores by using a soft/plastic Consistency of Concrete
Produced with Sika ViscoCrete® SCC technology

Definition of Watertightness

Crack-free concrete can be said to be “watertight” if the volume of water that can penetrate on one side, is lower than the volume of water that can evaporate from the opposite side.

Exposure
Water penetration under hydrostatic pressure
Testing
The water permeability limit for watertightness (according to EN 206/DIN 1048) is defined as a maximum water penetration (e) into the concrete of 50 mm.
Note: it is a prerequisite for these works that the concrete is of good quality, correctly compacted and that the correct solutions are also used for the joint design and sealing.

Exposure
Immersion and permanent water contact
Testing
Water conductivity qw in g/m² 3 h (SIA 162/1, Test No. 5)

Definition of Watertightness
According to Swiss Standard SIA 162/1

Water conductivity qw < vaporizable volume of water qd

Recommended range for watertight concrete: qd ≥ 10 g/m² 3 h
Concrete Jointing Technology for Producing Watertight Basement Structures

There are 3 different principles that can be applied to produce waterproof joints in watertight concrete basement structures:

**Principle 1: External Surface Applied**
Water ingress is stopped at the external surfaces of the structure.

- **Ideal for use:**
  - Where the steel reinforcement does not easily allow integral waterproofing
  - Where direct aggressive water contact, hydraulic pressure or ground movement cannot cause damage of the waterproofing (e.g. by abrasion)
  - Where water outside the structure has to be prevented from coming into contact with the reinforcement (e.g. aggressive sulphate or chloride containing water)
  - Where the waterproofing has to be protected from direct hydrostatic water pressure or ground movement (e.g. due to abrasion)
  - Together with Sikaplan® membrane system to form compartments

**Principle 2: Integral Cast in Place**
Water ingress is stopped inside the structural concrete.

**Principle 3: Internal Surface Applied**
Water ingress is stopped at the inside surface of the structure.

- **Ideal for use:**
  - When connecting to an existing building
  - For water-retaining structures (e.g. water tanks or containment areas)
  - For restoration and repair work

**The Selection Criteria (Principle 1–3)**

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<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Water pressure Grade 2</td>
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<td>Water pressure Grade 3</td>
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<td>Water pressure Grade 4</td>
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<td>Movement joint</td>
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<td>✗</td>
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<tr>
<td>Connection to existing buildings (movement)</td>
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<td>☑️</td>
<td>✗</td>
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<td>Combination with other systems</td>
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<td>Aesthetic aspects</td>
<td>☑️</td>
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</table>

- ✔️ Very good
- ✗ Limited
- ☑️ Not suitable
- ❌ Not suitable
Sealing of both Movement and Construction Joints with Sika® Waterbars

Sika® Waterbars are flexible preformed PVC waterstops for the waterproof sealing of both movement and construction joints that can be subject to low and high water pressure. They are cast in place during the construction of watertight concrete basements or water-retaining structures. Additional ribbed flanges are located on both sides for increased anchoring in the concrete, extending and effectively blocking the path for any water to penetrate.

Advantages
- Increased distance for any water penetration.
- No risks from inadequate concrete surface preparation.
- Application is not dependent on the weather.
- Secure waterproofing within the concrete structure.

Limitations
- Precise location and fixing is required.
- Complicated formwork and careful concreting work is required.
- Leaks are difficult to localize and to repair.
- Crack sealing is not integral.
- Connections between new and existing buildings are not possible.

Function
Increasing the length of path to prevent any water penetration.

The Sika Systems
Integral applied Sika® Waterbars cast integrally with the concrete construction. Different types are available:
- for movement joints
- for construction joints

External surface applied and cast in place Sika® Waterbars applied fixed on the blinding concrete. Different types are available:
- for movement joints
- for construction joints

Additional special profile systems Special oil resistant Sika® Waterbars are also available for use in containment areas or structures in groundwater protection zones, etc. Note: For all Sika® Waterbars standard pre-formed pieces are available for jointing, corners and crossover sections.

Sealing of Movement and Construction Joints with the Sikadur®-Combiflex® System

A high performance joint sealing system consisting of the Sikadur®-Combiflex® sealing strips and Sikadur®-Combiflex® epoxy adhesive. This system is renowned worldwide for proven performance in sealing difficult joints and/or cracks in all types of watertight and retaining structures. It is particularly useful in watertight basement construction and can be applied both internally and externally to meet the specific project’s requirements.

Advantages
- Easily adaptable to the construction programme.
- Easy to adapt to complicated construction details.
- Simultaneous additional crack repairs are possible.
- Damage or leaks can be repaired externally or internally.
- Easy to control the application because it is visible.
- Easy to repair damage.

Function
Blocking the path of water penetration, fully bonded to the concrete preventing underflow.

The Sika Systems
The selection of the appropriate width and thickness of the Combiflex membrane strip is dependent on the joint requirements and exposure:
- Sikadur®-Combiflex® strip thickness of 1 mm (40 mils) for low mechanical stress.
- Sikadur®-Combiflex® strip thickness of 2 mm (80 mils) for higher mechanical stress.
- The Sikadur®-Combiflex® strip widths available are 10/15/20 cm (4, 6 and 8 inches). Special widths on request.
- The Sikadur®-31 CF adhesive is available in both normal and rapid hardening grades.
- Sikadur®-31 DW is also approved for contact with drinking water.
Sika® Jointing Technology for Watertight Basement Structures

Sealing of Construction Joints with Sika® Injectoflex System Type HPM

Sika® Injectoflex hoses work in two phases to seal construction joints. Externally there are three yellow hydrophobic surface strips, which swell in contact with any moisture infiltration to seal the joint. In addition the system has three red foam strips which, together with holes in the preformed EPDM rubber core, act as valves through which the hoses can be injected to seal the joint and stop leaks, at any time that it is required in the future.

Advantages
- Accurate waterstopping in 2 phases.
- Injectable and re-injectable.
- Easy to install and cost effective.
- Adaptable to any design of structure and programme of works.
- No additional fixing of formwork or adjustment of steel reinforcement is required.

Limitations
- Not suitable for use in movement joints.

Function
The joint sealing process takes place in two phases:

Phase 1
Swelling takes place on contact with water. Sika® Injectoflex System Type HPM has hydrophilic (water absorbing) swelling profiles on each of its 3 sides. Any penetrating water "activates" these profiles which swell to fill the joint. This resulting pressure seals any gap preventing the passage of the water, which effectively seals the joint.

Phase 2
If necessary due to settlement, construction defects or increased water pressure, in a second waterstopping phase the Sika® Injectoflex hoses can be injected with Sika® InjectoCem-190 (micro-cement), Sika® Injection-201 (polyurethane resin) or with Sika® Injection-29 (water-swellable resin). These fill the voids and again prevent the passage of the water, effectively sealing the joint once more.

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- Accurate waterstopping in 2 phases.
- Injectable and re-injectable.
- Easy to install and cost effective.
- Adaptable to any design of structure and programme of works.
- No additional fixing of formwork or adjustment of steel reinforcement is required.

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Principle 2
It is sometimes deemed appropriate for the construction work to be planned to include this injection phase, in which case we can recommend the Sika® Injectoflex hose Type HPM, which has a "non-swelling" profile and is therefore more cost effective in these instances.
Sika® Jointing Technology for Watertight Basement Structures

Sealing of Construction Joints with SikaSwell® Hydrophilic Profiles and Sealants

SikaSwell® P profiles are fixed and then cast within the joint or connection area. Then they are able to swell in contact with any water that penetrates in the future, thus effectively blocking any further ingress and sealing the joint. SikaSwell® S-2 is an easily extrudable, gun-applied, hydrophilic, water-swelling sealant. These two products can be used individually and in combination with each other for the efficient sealing and waterproofing of construction joints and penetrations.

Advantages
- SikaSwell® P profiles (red)
  - swell in contact with water
- SikaSwell® PM profiles (yellow)
  - swell in contact with seawater
- Permanently water-resistant
- Permanently elastic
- Easy to apply
- No curing time required
- Has a protective coating on the profile to avoid any premature swelling during the installation on site

Function
In contact with water the external surfaces of the profiles swell. The resultant pressure blocks the path of any water penetration.

Limitations
- Not suitable for movement joints
- Cannot be injected
- Although SikaSwell® P has been tested watertight up to 2.0 bar, due to its limited profile length it is not generally recommended as the primary waterproofing system for hydrostatic pressure higher than 0.3 bar (typically Grade 1 or in combination with another system in penetration details; see graphic)
- In rapidly rising groundwater, immediate sealing is not possible due to the time required for the profile to swell, some leakage can occur during this limited period

Sealing of Penetrations

With any watertight construction, the continuity of the waterproofing system is essential for success. When pipe entries, utility services and conduits are placed in or through a basement structure, the watertightness is at risk. Therefore additional Sika® Systems are specifically designed to seal these penetrations, to ensure continuous waterproofing and thus producing a watertight structure to the specified requirements (i.e. Grades 1 to 4).

Pipe Entries
Pipe entries with low water pressure (<3 m/10 ft head of water)
Sika has developed simple and innovative systems for these applications, e.g.
- SikaSwell® profiles and/or SikaSwell® S extruded sealant.
- A further solution for pipe entries, utility services etc. is the Sikadur®-Combiflex® System. This can be applied after the concrete work is finished.

Formwork, Tie-bar Holes
In watertight structures, the formwork tie-bar holes always have to be sealed. Sikadur®-31 CF epoxy mortar is the ideal solution for this, but where possible the formwork should be designed with minimal tie-bars required to be inserted through the watertight slabs or walls.

Sump Pump System
In some Grade 1 or 2 structures in areas with high water pressure, so called automatic "sump pumps" can be installed to remove any accumulated water from seepage or other sources.

Before exposure to water
After exposure to water
Sika® Injection Technology for Waterproofing Construction Joints or Remedial Works to Leaking Basement Structures

Solutions for Leaks and Construction Damage

Concrete Damage
Damage can occur to the concrete in many ways but primarily through difficulties in interpreting design aspects, inadequate or untimely compaction, or by accident. Sika produces a full range of concrete repair systems, which are compatible with all Sika waterproofing systems.

Cracks/Honeycombing
The terms “watertight” and “vapour-tight” do not mean “crack-free”. Cracking can always occur in concrete in its plastic or in its hardened state, due to the stresses imposed. These include the internal forces caused by temperature and water content changes. Sika has a complete range of products and systems for the repair of “cracks” and “honeycombing” in water-tight concrete structures.

Waterproofing of Construction Joints
For sealing construction joints in a watertight structure, Sika provides a full range of products and systems:

**Sika Injection-101**
Fast-foaming, low-viscous polyurethane injection foam for temporary water-stopping

**Sika Injection-201**
Low-viscous, flexible polyurethane injection resin for permanent waterproof sealing

Sika InjectoCem-190
Two-component injection grout based on microfine cement

Waterproofing of Construction Joints
Sika® injection packers are used as connection pieces between the injection pump and the structure. Sika® provides a full range of packers for different applications.

Surface Sealing and Waterproofing of Concrete Structures
Remedial surface sealing by curtain injection of surface defects in below ground concrete structures:

**Sika Injection-304**
Flexible, very low-viscous and very quick-setting polyacrylate injection gel for permanent watertight sealing. The material reacts to form a waterproof, flexible but solid gel with good adhesion to both dry and wet substrates.

Surface Sealing and Waterproofing of Concrete Structures
Mechanical Packers
for high and low pressure injection where injection hole drilling is possible

Surface Packers
for low pressure injection, where drilling is not possible

Sika® Injection Pumps and Packers

Single-component Pumps for Polyurethane, Epoxy and Polyacrylate Resins
Sika® single-component injection pumps are universal injection devices suitable for a wide range of applications. They are designed for professional use in crack injection and for the Sika Injectoflex System. The Sika Injection Pump EL-1, EL-2, Hand-1 and Hand-2 are suitable for Sika polyurethane, epoxy and polyacrylate injection resins.

Two-component Pumps for Polyacrylate Gels
Sika® Injection Pump PN-2C is especially designed for curtain injection. A two-component pump is required for these fast-reacting polyacrylate gels. The individual resin components are introduced to the mixing head separately. The actual mixing process takes place in a static mixer located in the mixing head.

Mixing and Pumping Equipment for Microfine Cement Suspension
The colloidal mixer Sika Injection Mixer C-1 is designed for the complete and thorough mixing of Sika microfine cement suspensions. Sika Injection Pump MFC-1 is used for the pumping of Sika microfine cement suspensions. It provides continuous pumping without separation of the suspension.

**Product** | **Chemical base** | **Main use** | **Viscosity (at 20 °C)** | **Reaction time** | **Sika® injection packer type** | **Sika® Injection Pump type**
---|---|---|---|---|---|---
Sika® Injection-101 | Polyurethane foam | Temporary waterproofing | ~130 mPa·s | ~20 sec* | MPR or MPS | One-component injection pump type EL-1/2 or Hand-1/2
Sika® Injection-201 | Polyurethane resin | Permanent waterproof sealing of cracks | ~95 mPa·s | ~120 min | MPR, MPR or SP | One-component pump type MFC-1
Sika® Injection-29 | Polyacrylate resin | For the injection of Sika Injectoflex System and cracks | ~90 mPa·s | ~25 min | MPR, MPR or SP | One-component pump type MFC-1
Sika® InjectoCem-190 | Microfine cement | For the injection of Sika Injectoflex System and cracks | ~100 mPa·s (at 20 °C) | ~120 min | MPC | One-component pump type MFC-1
Sika® Injection-304 | Polyacrylate gel | Remedial surface sealing by curtain injection of leaking building components | ~7 mPa·s | ~40 sec | MPR | Two-component pump type PN-2C

* in contact with water
Waste Water Treatment Plant

Problem
- Concrete erosion due to acidic environment
- Concrete erosion due to swelling from sulphates
- Loss of alkaline protection and corrosion of reinforcement steel

Sika solution
- Application of Sikagard®-720 EpoCem® as a pore sealer and as a temporary moisture barrier
- Application of Sikagard® as a protective coating
- Application of Sikalastic®-830 liquid applied membrane for sewage purification plants

Internally applied Protective Coatings for increased Waterproofing chemical and mechanical Resistance

Chemochemically resistant Coatings
- Application of SikaTop®-Seal 107, the cement-based, polymer-modified protective and waterproof slurry, or a Sika®-1 rendering system for filling the surface defects and as an additional protective layer

Secondary Containment for Groundwater Protection

Problem
- Legal responsibility and environmental legislation
- Groundwater protection zones
- Aggressive chemicals in storage

Sika solution
- Application of Sikagard® EpoCem® as a temporary moisture barrier
- Application of Sikagard® as a protective coating against aggressive chemical attack

Underground Car Parks Deck Waterproofing Systems

Problem
- Increased water brought in on cars and other vehicles
- Concrete attack from de-icing salts
- Abrasion from traffic wheels

Sika solution
- Application of Sikafloor® deck coating systems
- Approved to EN 1504 and German DS Standard
- Vapour-tight and vapour-diffusible systems available

External vapour barrier required
- Contaminated groundwater

Exteriorly applied Protective Coatings to prevent aggressive Water Ingress to the Structure

Rigid Slurry Coating for Filling and Sealing Surface Defects

Problem
- Surface defects and blowholes (bugholes) etc.

Sika solution
- Application of SikaTop®-Seal 107, the cement-based, polymer-modified protective and waterproof slurry, or a Sika®-1 rendering system for filling the surface defects and as an additional protective layer

Protection against aggressive Ground Conditions

Problem
- Fine surface cracks and blowholes (bugholes) etc.
- External vapour barrier required
- Contaminated groundwater

Sika solution
- Application of a flexible, solvent-free, waterproof high-build bitumen coating Sika® Igolflex® or Sika® Inertol®

Controlled Environment with absolutely no Water or Vapour Ingress

Problem
- Sealing and protecting against water and water vapour

Sika solution
- Sikaplan® WT/ WP loose laid and welded waterproofing sheet membranes
- Application of Sikagard®-720 EpoCem® as a pore sealer and temporary moisture barrier
- Application of Sikalastic®-801 liquid polyurethane coating as a crack-bridging waterproofing membrane

Additional Sika® Technologies to meet individual Project Requirements in Watertight Basement Structures
# Watertight Concrete Basements with Sika® Concrete, Jointing, and Injection Technology

## The Sika® Waterproofing Products

<table>
<thead>
<tr>
<th>Category</th>
<th>Product</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Admixtures</strong></td>
<td><strong>Sika® ViscoCrete® (SCC)</strong></td>
<td>Ultra-high range water-reducing SCC (self-compacting concrete) admixture technology with high-range water reduction for waterproof concrete</td>
</tr>
<tr>
<td><strong>Jointing systems</strong></td>
<td><strong>Sika® Waterbars</strong></td>
<td>Elastic joint sealing system PVC and FPO joint waterstops for the sealing of both movement and construction joints, plus producing watertight compartments with Sikalaplan sheet membranes</td>
</tr>
<tr>
<td><strong>Jointing systems</strong></td>
<td><strong>Sikadur®-Combiflex®</strong></td>
<td>Elastic joint sealing system Movement and construction joint sealing, plus crack sealing system consisting of flexible membrane strips and epoxy adhesives</td>
</tr>
<tr>
<td><strong>Jointing systems</strong></td>
<td><strong>Sika® Dilatec®</strong></td>
<td>Elastic joint sealing system Joint sealing and termination detailing systems consisting of PVC-based membrane strips and epoxy adhesive</td>
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<tr>
<td><strong>Joint sealing hose system</strong></td>
<td><strong>Sika® Swell® P</strong></td>
<td>Swelling joint sealing profiles Hydrophilic swelling joint profiles for the sealing of construction joints</td>
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<tr>
<td><strong>Jointing systems</strong></td>
<td><strong>Sika® Injectoflex System</strong></td>
<td>Joint sealing hose system Injectable and re-injectable joint hoses for the sealing of construction joints</td>
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<tr>
<td><strong>Membranes</strong></td>
<td><strong>Sikaplan® WP and WT</strong></td>
<td>Flexible sheet membranes Sheet waterproofing membranes based on PVC with yellow signal top layers, or fabric-reinforced FPO with green signal layers, both available in a range of different thicknesses</td>
</tr>
<tr>
<td><strong>Membranes</strong></td>
<td><strong>Sikalastic®</strong></td>
<td>Flexible liquid membrane system Polyeurethane coatings for spray application on pore sealing primers as liquid applied waterproofing membranes</td>
</tr>
<tr>
<td><strong>Injection</strong></td>
<td><strong>Sika® Injection</strong></td>
<td>Solutions for remedial waterproofing of leaking concrete, joints and membranes including compartment systems</td>
</tr>
<tr>
<td><strong>Mortars</strong></td>
<td><strong>Sika®-1 renderings, Sika® MonoTop®, SikaTop® and EpoCem® slurry coats and waterproofing renderings</strong></td>
<td>Polymer or epoxy modified cementitious slurry coatings or waterproofing coatings and improving the concrete surface resistance</td>
</tr>
</tbody>
</table>

## Also available from Sika

- **Waterproofing of Basements**
- **Flexible Waterproofing of Basements**
- **Joint Sealing with Sika® Dilatec®**
- **Sika® Injection Systems**
- **Flexible Waterproofing of Tunnels**

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